

APPENDIX D TO CONSENT DECREE

Post-Construction Monitoring

1. Overview

Elyria shall submit all required post-construction monitoring deliverables and conduct all required post-construction monitoring activities pursuant to the provisions set forth in this Appendix D. The objectives of post-construction monitoring are to: (a) evaluate the performance of the Control Measures implemented pursuant to Appendix C (a.k.a., Wet Weather Integrated Plan) and compare that performance to the required Appendix C Performance Criteria; and (b) assess the effect of discharges from Elyria's Sewer System on the water quality of the Black River. To meet these objectives, Elyria shall complete three categories of post-construction monitoring activities described below:

1. Wastewater Treatment Plant Upgrades Control Measure: Elyria shall execute and complete Control Measure 4 post-construction monitoring activities, and all required submission, reporting, and notice requirements, pursuant to Section 2 of this Appendix.
2. CEPT/HRD Control Measure: Elyria shall submit a plan to execute and complete and shall execute and complete Control Measure 5 post-construction monitoring activities, and all required submission, reporting and notice requirements, pursuant to Section 3 of this Appendix.
3. Sewer System Overflow Control Measures and Water Quality: Elyria shall submit a plan to execute and complete and shall execute and complete post-construction monitoring activities for Control Measures 1 through 3 and 6 through 21 ("Sewer System Overflow Control Measures") that shall include water quality monitoring and modeling, and all required submission, reporting, and notice requirements, pursuant to Section 4 of this Appendix.

2. Post-Construction Monitoring: Wastewater Treatment Plant Upgrades

2.1. Implementation of Post-Construction Monitoring

For a period of one year upon Achievement of Full Operation of Control Measure 4, Elyria shall demonstrate that: 1) all WWTP improvements were designed and constructed and are operational and functioning pursuant to Control Measure (CM) 4 in Appendix C; and 2) Elyria has consistently treated all flows up to a flow rate of 40 MGD through full treatment (i.e., all flow receiving preliminary, primary, and secondary followed by disinfection). To demonstrate the above during that one-year period Elyria shall do the following:

1. Monitor flow at the WWTP at the following locations:
 - a. East Side Interceptor influent;
 - b. West Side Interceptor influent;
 - c. East and west primary treatment flumes;

- d. Influent to the wet weather storage tank (WWST) (from all WWST influent locations)
 - e. Effluent from the WWST that is discharged to the Black River through any outfall at the WWTP, including all bypass outfalls, other than through WWTP outfall 001;
 - f. Influent to the Intermediate Storage Tanks; and
 - g. Effluent discharged from the WWTP after full treatment through outfall 001.
2. Conduct all sample collection, measurements, and pollutant/parameter analyses at the WWTP as required by Elyria's NPDES Permit.
3. Document plant operations so as to allow the evaluation of any noncompliance with NPDES permit limits or any bypassing at WWTP influent flows less than 40 MGD. At a minimum, document aeration basin dissolved oxygen concentrations, aeration mixed liquor suspended solids (MLSS) concentrations, return activated sludge (RAS) rates and secondary clarifier sludge blanket depths.

2.2. CM 4 Post-Construction Monitoring Report

Two years following Achievement of Full Operation of CM 4, Elyria shall submit a report that documents CM 4 post-construction monitoring activities ("CM 4 Post-Construction Monitoring Final Report") that include, at a minimum: a description of all post-construction monitoring activities conducted during the one-year post-construction monitoring period for CM 4; all flow and pollutant/parameter monitoring results; and a demonstration that all WWTP improvements are operational and functioning as designed and constructed pursuant to Appendix C. The following information, at a minimum, shall be included in the CM 4 Post-Construction Monitoring Final Report:

1. Description of all flow monitoring and pollutant/parameters monitoring activities.
2. Summary of WWTP operations, including atypical conditions.
3. Detailed discussion of all deviations from Consent Decree and NPDES Permit requirements.
4. Flow and sampling data summaries, with detailed data provided as appendices to the CM 4 Post-Construction Monitoring Report.
5. Evaluation of Elyria's compliance with CM 4 Performance Criteria and Elyria's NPDES Permit.
6. Identification of all remedies and corrective actions measures to address any noncompliance with the Consent Decree or Elyria's NPDES Permit during the CM 4 post-construction monitoring period.
7. A then-current WWTP flow schematic that includes: a) an identification of all process steps and operations at the WWTP; b) an identification of all flow bypasses and diversions; and c) an identification of all flow monitoring locations.

3. Post-Construction Monitoring: CEPT/HRD

3.1. Overview

By 24 months prior to Achievement of Full Operation of Control Measure 5, Elyria shall submit to EPA and Ohio EPA for review and approval, a plan to conduct post-construction monitoring for the CEPT/HRD (“CEPT/HRD Post-Construction Monitoring Plan”) that will detail Elyria’s proposed plan to collect all information and data necessary to evaluate compliance with the Control Measure 5 Performance Criteria, as set forth in Appendix C, which consists of Numeric Performance Criteria (“CM 5 Numeric Performance Criteria”) for total suspended solids (TSS), *E. coli*, and total residual chlorine (TRC)¹, and Operational Performance Criteria (“CM 5 Operational Performance Criteria”). The CEPT/HRD Post-Construction Monitoring Plan shall include all required elements set forth in Sections 3.2 through 3.9, below. Elyria shall implement the CEPT/HRD Post-Construction Monitoring Plan, as approved by EPA (in consultation with Ohio EPA), upon Achievement of Full Operation of Control Measure 5 and shall submit all required notices and reports pursuant to Sections 3.2 through 3.10, below.

3.2. CEPT/HRD Post-Construction Monitoring Phases and Duration

There are two phases of monitoring and reporting requirements: (a) Phase 1 applies following Achievement of Full Operation of CM 5 (“CM 5 Phase 1 Post-Construction Monitoring Period”) until Phase 1 ends as described in the remainder of this paragraph; and (b) Phase 2 applies for the duration of the Consent Decree after the CM 5 Phase 1 Post-Construction Monitoring Period has ended (“CM 5 Phase 2 Post-Construction Monitoring Period”). The duration of the CM 5 Phase 1 Post-Construction Monitoring Period and the start of the Phase 2 Post-Construction Monitoring Period may be different for TSS, *E. coli*, and TRC, and shall be based on the length of time it takes to collect 14 Qualifying Samples as defined in Section 3.4 for each parameter or for one year, whichever period of time is longer. During CM 5 Phase 1 Post-Construction Monitoring Period, Elyria shall also collect flow-weighted composite samples to analyze for carbonaceous biochemical oxygen demand (CBOD), which shall be collected for information purposes. For all CEPT/HRD requirements under Sections 3.2 through 3.10 that pertain to CM 5 Phase 1 Post-Construction Monitoring Period, “day” shall mean calendar day. For all CEPT/HRD requirements under Sections 3.2 through 3.10 that pertain to CM 5 Phase 2 Post-Construction Monitoring Period, “day” shall mean business day that may exclude weekends, Federal, Ohio State, and City holidays.

¹ If Elyria has received approval from EPA and Ohio EPA to use an alternative disinfection technology that results in or produces a disinfection residual, but that is not a chlorine-based disinfectant, Elyria shall not be required to monitor for TRC but instead shall be required to monitor for the appropriate alternative disinfection residual parameter based on Elyria’s chosen disinfection technology as approved by EPA and Ohio EPA. All provisions in Appendix D related to TRC shall be applicable to and required for the appropriate alternative disinfection residual parameter. See Appendix C, CM 5 Design Criteria and Performance Criteria for alternative disinfection technology approval provisions and required Numeric Performance Criteria.

3.2.1. Total Suspended Solids and Carbonaceous Biochemical Oxygen Demand

The CM 5 Phase 1 Post-Construction Monitoring Period for TSS and CBOD, shall last until both: (a) Elyria has been in continuous compliance with the CM 5 Numeric Performance Criterion for TSS for either a one-year length of time after Achievement of Full Operation of CM 5 or for the length of time it takes Elyria to collect 14 Qualifying Samples of discharges from the CEPT/HRD on 14 days for TSS, whichever length of time is longer; and (b) Elyria provides written notification to EPA and Ohio EPA in accordance with Section XVI (Notices) of the Consent Decree that it has collected the required number of Qualifying Samples for TSS and has been in continuous compliance with the CM 5 Numeric Performance Criterion for TSS for the required period of time. The CM 5 Phase 1 Post-Construction Monitoring Period for TSS and CBOD shall end on the date of the written notification, provided that both of these conditions are met. The CM 5 Phase 2 Monitoring Period for TSS shall begin on the day after the date of the written notification and last for the duration of the Consent Decree. Elyria is not required to monitor for CBOD during the CM 5 Phase 2 Post-Construction Monitoring Period.

3.2.2 *E. coli*

The CM 5 Phase 1 Post-Construction Monitoring Period for *E. coli* shall last until both: (a) Elyria has been in continuous compliance with the CM 5 Numeric Performance Criterion for *E. coli* for either a one-year length of time after Achievement of Full Operation of CM 5 or for the length of time it takes Elyria to collect 14 Qualifying Samples of discharges from the CEPT/HRD on 14 days for *E. coli*, whichever length of time is longer; and (b) Elyria provides written notification to EPA and Ohio EPA in accordance with Section XVI (Notices) of the Consent Decree that it has collected the required number of Qualifying Samples for *E. coli* and has been in continuous compliance with the CM 5 Numeric Performance Criterion for *E. coli* for the required period of time. The CM 5 Phase 1 Post-Construction Monitoring Period for *E. coli* shall end on the date of the written notification, provided that both of these conditions are met. The CM 5 Phase 2 Post-Construction Monitoring Period for *E. coli* shall begin on the day after the date of the written notification and last for the duration of the Consent Decree.

3.2.3. Total Residual Chlorine

The CM 5 Phase 1 Post-Construction Monitoring Period for TRC shall last until both: (a) Elyria has been in continuous compliance with the CM 5 Numeric Performance Criterion for TRC for either a one-year length of time after Achievement of Full Operation of CM 5 or for the length of time it takes Elyria to collect 14 Qualifying Samples of discharges from the CEPT/HRD on 14 days for TRC, whichever length of time is longer; and (b) Elyria provides written notification to EPA and Ohio EPA in accordance with Section XVI (Notices) of the Consent Decree that it has collected the required amount of Qualifying Samples for TRC and has been in continuous compliance with the CM 5 Numeric Performance Criteria for TRC for the required period of time. The CM 5 Phase 1 Post-Construction Monitoring Period for TRC shall end on the date of the written notification, provided that both of these conditions are met. The CM 5 Phase 2 Monitoring Period for TRC shall begin on the day after the date of the written notification and last for the duration of the Consent Decree.

3.3. CEPT/HRD Influent, Effluent, and Diversion Flow Monitoring

Upon Achievement of Full Operation of CM 5 and for the duration of the Consent Decree thereafter (i.e., during both the CM 5 Phase 1 and Phase 2 Post-Construction Monitoring Periods), Elyria shall continuously monitor influent flow to, effluent flow from, and any diversions around the CEPT/HRD. The CEPT/HRD influent flow shall be monitored using a flow meter(s) installed upstream of the CEPT/HRD at a location upstream of the CEPT basin(s) that does not include any flow being diverted around the CEPT/HRD. The CEPT/HRD effluent flow shall be monitored using a flow meter(s) installed downstream of the CEPT/HRD at a location that is downstream from the HRD basin(s) that does not include any flow other than the CEPT/HRD treated flow. All flows that are diverted around the CEPT/HRD shall be monitored at a location that includes all flow diverted around the CEPT/HRD and that excludes all flows receiving CEPT/HRD treatment. During the CM 5 Phase 1 Post-Construction Monitoring Period, Elyria shall also continuously monitor flow at the WWTP at the locations identified in Section 2.1, above.

3.4. Qualifying Samples

During the CM 5 Phase 1 and Phase 2 Post-Construction Monitoring Periods, a “Qualifying Sample” shall be defined as:

1. Any TSS or CBOD composite sample of the CEPT/HRD discharge during a CEPT/HRD Discharge Event, which is defined in Section 3.5, below, that is collected at a location downstream of the CEPT/HRD that captures the flow following CEPT, in a manner consistent with Section 3.6.1, and that excludes flow that does not go through CEPT followed by HRD. If a CEPT/HRD Discharge Event occurs and the discharge continues intermittently during the day, starting and stopping several times, Elyria shall use best efforts to collect as many samples as needed to characterize the CEPT/HRD discharge during that day to obtain a single Qualifying Sample result for each parameter for that day. To accomplish this, Elyria may do one of the following: a) collect a single composite across the entire duration of all discharges on that day and use the analytical results of that sample; b) collect multiple composite samples and manually composite all of the composite samples for that day; or c) collect and analyze the separate composite samples and arithmetically average the analytical results.

2. Any *E. coli* grab sample of the CEPT/HRD discharge during a CEPT/HRD Discharge Event that is collected at a location downstream of CEPT/HRD that captures the flow following disinfection in a manner consistent with Section 3.6.1, and that excludes flow that does not go through CEPT followed by HRD. Elyria shall collect at least one grab sample per day during which a CEPT/HRD Discharge Event occurs. If Elyria chooses to collect multiple grab samples on a given day, Elyria shall calculate the geomean using the results of all individual sample results collected on that day and use that calculated geomean as the day’s Qualifying Sample value.

3. Any TRC grab sample of the CEPT/HRD discharge during a CEPT/HRD Discharge Event that is collected at a location downstream of CEPT/HRD that captures the flow following disinfection, in a manner consistent with Section 3.6.1, and excludes flow that

does not go through CEPT followed by HRD. Elyria shall collect at least one grab sample per day during which a CEPT/HRD Discharge Event occurs. If Elyria chooses to collect multiple grab samples on a given day, Elyria shall use the highest sample result as the day's Qualifying Sample value.

3.5. CEPT/HRD Discharge Event

A CEPT/HRD Discharge Event is defined as a continuous CEPT/HRD treated effluent discharge from the CEPT/HRD system following treatment through CEPT/HRD for more than 30 minutes and if discharge subsequently occurs intermittently during a day, it shall be considered the same Discharge Event.

3.6. CEPT/HRD Discharge Parameter Monitoring

3.6.1. CM 5 Phase 1 Post-Construction Monitoring

During the CM 5 Phase 1 Post-Construction Monitoring Periods, Elyria shall collect Qualifying Samples of the CEPT/HRD treated effluent and conduct analysis for TSS, *E. coli*, and TRC (to evaluate compliance with the CM 5 Numeric Performance Criteria) and for CBOD (for informational purposes only). Elyria shall follow its established protocols, which Elyria shall include in the submitted CEPT/HRD Post-Construction Monitoring Plan, for collecting, handling, preserving, holding and analyzing samples at the WWTP, and 40 CFR Part 136 when collecting and analyzing samples of discharges from the CEPT/HRD. In addition:

1. Grab or composite sample collection in accordance with Section 3.2 shall not be required to begin until 30 minutes after the start of CEPT/HRD discharge.
2. Samples for analyzing TSS and CBOD shall be collected as flow-proportioned composite samples to characterize the CEPT/HRD discharges on each day. Elyria shall make every effort to collect representative samples of sufficient volume to allow for analysis for all required parameters. If insufficient sample volume is collected by the composite samplers to allow for the analysis for all required parameters, Elyria shall prioritize the analysis of TSS before CBOD.
3. Samples for analyzing *E. coli* and TRC shall be collected as one or more discrete grab samples per day of discharge from the CEPT/HRD to characterize CEPT/HRD performance. If a discharge from the CEPT/HRD occurs over the course of two or more days, a minimum of one sample per day shall be collected except:
 - a. if the discharge begins within the last one hour of any day (i.e., after 11 p.m., but before midnight) no samples shall be collected that day and that discharge shall be considered to have begun on the following day; and
 - b. if the discharge begins on one day and ends on the following day within the first one hour of the second day (i.e., after midnight, but before 1 a.m.) and no grab sample has been collected during the second day, the discharge is

considered to have ended on the first day, for the purpose of collecting *E. coli* and TRC grab samples.

3.6.2. CM 5 Phase 2 Post-Construction Monitoring

During the CM 5 Phase 2 Post-Construction Monitoring Periods, Elyria only needs to comply with the monitoring and analysis requirements described above for TSS, *E. coli* and TRC for CEPT/HRD Discharge Events and is not required to comply with monitoring and analysis requirements for CBOD.

3.7. NPDES Permit Monitoring in Lieu of CM 5 Phase 2 Post-Construction Monitoring

CM 5 Phase 2 Post-Construction Monitoring requirements for TSS, *E. coli*, and/or TRC apply until both:

1. There is an NPDES permit with numeric effluent limitations and monitoring requirements for discharges from the CEPT/HRD for the parameter at issue (TSS, *E. coli*, and/or TRC) that are legally in effect (i.e., the limitations and requirements are not stayed) and those limitations and monitoring requirements do not include, incorporate or otherwise account for flows that do not go through the CEPT/HRD; and
2. Elyria provides written notification to EPA and Ohio EPA in accordance with Section XVI (Notices) of the Consent Decree of these facts. The date on which the NPDES monitoring requirements begin to apply in lieu of those described above shall be the date of the written notification, provided both of these conditions are met.

3.8. Rolling 7-day Arithmetic Mean and Geomean Calculations

Elyria shall calculate the rolling 7-day TSS arithmetic means and rolling 7-day *E. coli* geomeans based on Qualifying Samples after there have been at least 7 days of discharge in which Qualifying Samples were collected on each day of discharge for the specific parameter at issue for purposes of evaluating compliance with the CM 5 Numeric Performance Criteria as follows:

1. The first 7-day arithmetic mean and 7-day geomean will be calculated by taking the arithmetic mean and geomean, respectively, of the Qualifying Samples from each of the 7 days of discharge.
2. With each additional day of discharge that has a Qualifying Sample, the rolling 7-day arithmetic means and rolling 7-day geomeans will be recalculated using the most recent 7 Qualifying Samples from the most recent 7 days of discharge.

3.9. Additional CEPT/HRD Post-Construction Monitoring Plan Requirements

The CEPT/HRD Post-Construction Monitoring Plan shall also include the following:

1. A detailed schematic of the CEPT/HRD system that shows all CEPT/HRD basins including any screening facilities, chemical feed locations, all flow monitoring locations, all sampling locations, influent and effluent locations, all pipes and flow conveyances connected to the CEPT/HRD system, and the CEPT/HRD discharge outfall.
2. A map that shows a scaled plan view of the CEPT/HRD system that shows all CEPT/HRD basins including any screening facilities, chemical feed locations, all flow monitoring locations, all sampling locations, influent and effluent locations, all pipes and flow conveyances connected to the CEPT/HRD system, and the CEPT/HRD discharge outfall.
3. Description of all CEPT/HRD component specifications (e.g., basin capacities and configurations, all chemical feed equipment ratings and capacities, all mixing equipment ratings and capacities, all screens sizes, etc.)
4. All chemicals and chemical feed rates for each chemical to be used in each step of the CEPT/HRD system.
5. Description of how flow will be handled if it does not go through the CEPT/HRD for treatment.

3.10. Semi-Annual Reporting

Following Achievement of Full Operation of CM 5 and for the duration of the Consent Decree, Elyria shall include the following information pertaining to discharges from the CEPT/HRD in the Semi-Annual Progress Reports that it submits in accordance with Section VIII (Reporting Requirements) of the Consent Decree for the relevant six-month period:

1. Tabular Summaries of Monitoring Information:

Except as provided below with respect to NPDES Permit Report Information, the Semi-Annual Reports shall include a tabular summary of:

- a. all 7-day arithmetic means for TSS and 7-day geomeans for *E. coli* that were calculated in accordance with Section 3.8 for samples that met the definition of Qualifying Sample;
- b. all TRC analytical results; and
- c. identification of whether each 7-day arithmetic mean, 7-day geomean and TRC analytical result complied with the CM 5 Numeric Performance Criteria.

2. NPDES Permit Report Information In lieu of Tabular Summaries:

If NPDES permit monitoring requirements apply in lieu of Phase 2 Post-Construction Monitoring Requirements in accordance with Section 3.7 above, then Elyria shall provide in the Semi-Annual Progress Reports all monitoring reports and all other notifications and reports required by the NPDES permit for the pollutant(s) at issue to be submitted to Ohio EPA for the CEPT/HRD discharges rather than the tabular summaries described above.

3. CM 5 Phase 1 Post-Construction Monitoring Information:

Section 3.6.1 includes monitoring requirements that only apply during the Phase 1 Post-Construction Monitoring Periods. In addition to the tabular summaries and NPDES permit reports described above, the Semi-Annual Progress Reports shall also include tabular summaries of all of the analytical results that have been obtained in accordance with the sampling and monitoring requirements set forth for the CM 5 Phase 1 Post-Construction Monitoring Periods in Section 3.6.1, including:

- a. the date and time each sample was collected;
- b. the concentration of each pollutant parameter;
- c. all applicable analytical results data qualifiers;
- d. CEPT/HRD discharge flow rate at the time each sample was collected;
- e. the maximum CEPT/HRD discharge flow rate for the 60 minutes prior to the time each sample was collected; and
- f. date and time of the maximum CEPT/HRD discharge flow rate identified in e, above.

3.11. CEPT/HRD Post-Construction Monitoring Final Report

Elyria shall submit a “CM 5 Post-Construction Monitoring Final Report” to EPA and Ohio EPA for review and within 12 months of the date that the last Phase 1 Post Construction Monitoring Period for TSS; *E. coli*; or TRC has concluded. The CM 5 Post-Construction Monitoring Final Report shall include the following information collected during all the CM 5 Phase 1 Post-Construction Monitoring Periods:

1. A tabular summary of all of the analytical results that have been obtained in accordance with the sampling and monitoring requirements set forth for the CM 5 Phase 1 Post-Construction Monitoring Periods in this Section 3.6.1, including:
 - a. the date and time each sample was collected;
 - b. the concentration of each pollutant parameter;
 - c. any applicable analytical results data qualifiers;
 - d. CEPT/HRD discharge flow rates at the time each sample was collected;
 - e. maximum CEPT/HRD discharge flow rate for the 60 minutes prior to the time each sample was collected; and
 - f. the date and time of the maximum CEPT/HRD discharge flow rate identified in e, above.
2. A tabular summary of:
 - a. all 7-day arithmetic means for TSS and 7-day geomeans for *E. coli* that were calculated in accordance with Section 3.8 for samples that met the definition of Qualifying Sample since the date of Achievement of Full Operation for CM 5;
 - b. all TRC analytical results; and

- c. identification of whether each 7-day arithmetic mean, 7-day geometric mean and TRC analytical result complied with the CM 5 Numeric Performance Criteria.
3. For each day that there were discharges from the CEPT/HRD, provide a 24-hour hydrograph that presents the CEPT/HRD discharge flow rate during that 24-hour period and that identifies when each grab and composite sample was collected. Include the following additional elements on each day hydrograph:
 - a. total WWTP influent flow;
 - b. influent flow into the CEPT/HRD;
 - c. CEPT/HRD discharge flow rate excluding flow that does not go through the CEPT/HRD; and
 - d. flow bypassed or diverted around the CEPT/HRD.
4. Analytical and field measurement methods used to test each sample for the specific parameter analyzed or measured; copies of all field logs and bench sheets; copies of all chain of custody forms; copies of all final analytical laboratory reports; and copies of all records that contain any manual flow-weighted (a.k.a., flow-proportioned) compositing calculations, if any.
5. For each CEPT/HRD Discharge Event, a description of all operational problems encountered during the Event, all remedies taken to address those operational problems, and a summary of all CEPT/HRD chemical dosages used throughout the CEPT/HRD Discharge Event.
6. For any CM 5 Phase 2 Post-Construction Monitoring conducted prior to the date of the end of the last CM 5 Phase 1 Post-Construction Monitoring Period shall be included in the CM 5 Post-Construction Monitoring Final Report, include all information listed in Section 3.2 and an assessment of whether those CM 5 Phase 2 analytical results are consistent with the CM 5 Phase 1 analytical results for the same parameter.

4. Post-Construction Monitoring: Sewer System Overflow Control Measures

By December 31, 2042 (i.e., by 24 months prior to the last Achievement of Full Operation date of CMs 1 through 3 and 6 through 21), Elyria shall submit to EPA for review and approval, in consultation with Ohio EPA, a plan: (a) to conduct post-construction monitoring to evaluate the performance of all Sewer System Overflow Control Measures (CMs 1 through 3 and 6 through 21); and (b) to conduct water quality monitoring and modeling. This plan, "Overflow and Water Quality Post-Construction Monitoring Plan," shall include all required elements set forth in Sections 4.1 and 4.2, below. Elyria shall implement the Overflow and Water Quality Post-Construction Monitoring Plan as approved by EPA upon Achievement of Full Operation of the last Sewer System Overflow Control Measure and shall submit a final report pursuant to the requirements set forth in Section 4.3, below.

4.1 Sewer System Overflow Control Measures

4.1.1 Post-Construction Data Collection

Elyria shall collect the necessary rainfall, sewer system, and overflow data for a one-year period following Achievement of Full Operation of the last of the Sewer System Overflow Control Measures. Elyria shall monitor rainfall (i.e., collect rainfall data) at a minimum of three locations using automatic rain gauges that: record rainfall at least every 15 minutes, or at more frequent intervals; have a rainfall collection sensitivity of 0.01 inches, or a higher sensitivity; and are consistent with industry practice current at the time of rainfall data collection. Elyria shall monitor the level and flow within its Sewer System. Specifically, Elyria shall collect hydraulic grade line data, using level sensors, and flow data, using area/velocity flow meters, in Elyria's Sewer System at sufficient locations to allow validation and, if necessary, recalibration of its hydrologic and hydraulic collection system model(s) ("H&H model(s)"). Elyria shall install the level sensors and area/velocity flow meters at key locations on all interceptors and significant trunk sewers such that validation and, if necessary, recalibration of its H&H model(s) can be completed successfully. Elyria shall maintain, evaluate, and use the collected data from the level sensors and area/velocity flow meters consistent with industry practice current during the time period of level and flow data collection. Elyria shall also monitor the discharges through CSO Outfalls and SSOs, in frequency and volume, at the appropriate locations such that validation and, if necessary, recalibration of its H&H model(s) can be completed successfully. Elyria shall carry out all rainfall, level, flow, CSO and SSO monitoring in accordance with industry practice, including meter maintenance and data review and quality assurance procedures.

4.1.2 Validation of System Model(s)

Elyria shall use the data collected during the one-year period as described in Section 4.1.1, above, to validate the most current up-to-date version of the Elyria's H&H model(s) that includes representations of all the Sewer System Overflow Control Measures in Appendix C as constructed and the hydraulic location of Control Measure 5. The model shall be considered validated based upon application of the Chartered Institution of Water and Environmental Management (CIWEM) Urban Drainage Group's Wastewater Planning User Group Code of Practice for the Hydraulic Modelling of Urban Drainage Systems, 2017 (CIWEM 2017 Code of Practice), or any update to 2017 Code of Practice. In addition to application of the numeric and qualitative criteria in Section 6.5 of the Code of Practice, Elyria shall specifically consider as a primary validation criterion the degree to which the number of CSO and SSO events simulated for the monitoring period match those detected during that same period by Elyria's overflow monitoring. If the number of overflow events simulated for the monitoring period fail to closely match those detected during that same period by Elyria's overflow monitoring, considering inherent model error, the model shall be deemed to not be validated.

4.1.3 Recalibration and Validation of System Model(s) (if necessary)

If the model is not successfully validated as described above, Elyria shall select three or more time periods, each containing suitable wet weather events to recalibrate the model, such that the model can be determined to be validated as described above. Elyria may also

choose to use a continuous recalibration approach using all appropriate storms within the post-construction monitoring period.

4.1.4 Evaluation of Typical Year CSO Continuous Simulation Results

Elyria shall evaluate the performance of the CSO Control Measures (i.e., all Appendix C Control Measures that are addressing or controlling at least one CSO Outfall) and determine if the Control Measures have met the Appendix C Performance Criteria by modeling a year of rainfall in Elyria's most up-to-date H&H model(s) that includes a representation of all of the completed Appendix C Control Measures. Elyria's model simulation shall be a continuous simulation using Elyria's "typical year," which is a synthetic year of rainfall that is a combination of 1991 and 1993 rainfall recorded at the Cleveland Hopkins Airport that was created based on the analysis of 45 years of rainfall (1949-1993). Table D-1, below, lists all the typical year storms, the dates, the hour, duration, depth and intensity of precipitation event. Elyria will use the validated, and/or recalibrated, hydraulic model to run the "typical year" to determine whether the CSO control measures have achieved the Performance Criteria identified in the Consent Decree.

If the modeled overflow frequency using the validated, and/or recalibrated, hydraulic model exceeds the level required for a given CSO, Elyria shall evaluate both modified operating practices as well as further infrastructure improvements. Alternate operating procedures and any additional infrastructure improvements needed to achieve the CSO Performance Criteria will be documented in the Overflow and Water Quality Post-Construction Monitoring Final Report (see Section 4.3, below). This report will include details on any additional work needed to achieve the Performance Criteria as well as a proposed implementation schedule for that work.

4.1.5 SSO Elimination Results Evaluation

Elyria will use the validated and/or recalibrated hydraulic model to run the "5-year, 2-hour" and "10-year, 2-hour" storm events, and any other storms necessary to demonstrate the required compliance with SSO elimination as set forth in Appendix C. If SSOs have been reported as part of Elyria's monitoring of CSOs and SSOs during the one-year period following Achievement of Full Operation of all Control Measures in Appendix C, Elyria shall characterize the return interval and duration of the rain events that triggered SSOs using Bulletin 71, Rainfall Frequency Atlas of the Midwest, Huff & Angel, 1992; etc.). If the triggering rain events are inconsistent with the required SSO elimination criteria as set forth in Appendix C, Elyria will recalibrate its model, if necessary, considering inherent model error and spatial variability of rainfall.

4.2 Water Quality Monitoring

Elyria shall include in its Overflow and Water Quality Post-Construction Monitoring Plan detailed description and methodology for monitoring the water quality of the Black River and the methodology Elyria will use to assess the effect of discharges from Elyria's Sewer System on the water quality of the Black River. Elyria shall include a quality assurance project plan(s) (QAPP), a field sampling plan(s), and all relevant standard operating procedures with the description and methodology for water quality monitoring. Elyria shall develop and implement the QAPP, and all other field sampling plans and documentation, that conforms to EPA

Requirements for Quality Assurance Project Plans, EPA QA/R-2, EPA/240/B-01/002 (March 2001) or any superseding document; and EPA Guidance for Quality Assurance Project Plans, EPA/QA/G-5, EPA 240-R-02-009 (December 2002) or any superseding document.

Elyria's assessment of the effect of discharges from Elyria's Sewer System on the water quality of the Black River shall focus on the effect of the discharges in terms of *E. coli*, the identified pollutant of concern, or other comparable pollutant that has replaced *E. coli* in the State of Ohio's recreational water quality standards. This data shall be compared to other available historical water quality data collected prior to implementation of the Control Measures.

As part of Elyria's water quality monitoring of the Black River, Elyria shall collect in-stream samples at a minimum six locations in the Black River under varying weather and flow conditions during the recreation season (currently defined as May 1 through October 31):

1. Upstream on the West Branch of the Black River at the bridge on Oberlin Elyria Road between Russia Road and Hall Road)
2. Downstream on the West Branch of the Black River at a location that is downstream of all of the CSOs and SSOs that discharge to the West Branch of the Black River.
3. Upstream on the East Branch of the Black River at the bridge on Fuller Road between Sandy Lane and East River Road)
4. Downstream on the East Branch of the Black River at a location that is downstream of the Eastern Falls of Cascade Park and upstream of the confluence of the East and West Branches of the Black River Cascade Falls Park
5. Downstream of the confluence of the East and West Branches of the Black River at Cascade Park
6. Downstream of the WWTP discharge outfall 001 into the Black River at the bridge at Ford Road east of I-90/Ohio State Route 2 at the bridge at Detroit Road west of East River Road/Gulf Road

Elyria shall take sufficient samples under varying weather and flow conditions to provide sufficient data to allow an assessment of decreases in the counts (i.e., concentration) of *E. coli* in the Black River following implementation of the Control Measures and to provide data to compare to Ohio's water quality standards. Elyria shall collect all in-stream samples in the Black River under different conditions to fully evaluate the effect of Elyria's CSO and SSO discharges on the Black River and to differentiate between *E. coli* concentrations in the Black River that are due to Elyria's CSOs and SSOs and those that are not. To that end, Elyria shall conduct in-stream sampling under the following conditions, at a minimum:

1. during dry weather when *E. coli* levels in the Black River are expected to have been minimally impacted, if at all, by *E. coli* from Elyria's CSOs and SSOs;
2. during wet weather events that occur on days when Elyria's CSOs and SSOs are not discharging; and
3. during wet weather events that occur on days when Elyria's CSOs and SSOs are discharging.

When sampling during wet weather events that occur on days when Elyria's CSOs and SSOs are discharging, Elyria shall collect in-stream samples at a time when discharge from any of Elyria's CSOs or SSOs upstream of the sampling location would be expected to have reached the sample location.

Sampling shall be done at a correspondingly appropriate time relative to the other sampling events to enable for an assessment of how *E. coli* levels in the Black River are impacted by Elyria's CSOs and SSOs. If the State of Ohio's water quality standards have been revised to replace *E. coli* with another parameter as a recreational use criterion, then Elyria shall sample for such parameter, in lieu of sampling for *E. coli*.

4.3 Overflow and Water Quality Post-Construction Monitoring Final Report

On or before December 31, 2046, Elyria shall submit to the EPA and Ohio EPA a report on the completed Overflow and Water Quality Post-Construction Monitoring Plan activities that shall include an overflow performance and water quality evaluation. This report, "Overflow and Water Quality Post-Construction Monitoring Final Report," shall:

1. Demonstrate that Elyria completed all of the requirements of the approved Overflow and Water Quality Post-Construction Monitoring Plan;
2. Evaluate whether the Sewer System Overflow Control Measures implemented pursuant to Appendix C meet the Performance Criteria set forth in Appendix C;
3. Evaluate how well Elyria's Sewer System is performing as a whole, following completion of all Control Measures, and shall include an assessment of whether the Control Measures implemented pursuant to Appendix C, as constructed, operated, or otherwise implemented, have achieved the Performance Criteria;
4. Summarize the data collected during the entirety of the Sewer System Overflow post-construction monitoring period and include any new data relevant to the evaluation that Elyria did not previously submit to EPA or Ohio EPA;
5. If model or monitoring results show that Elyria's Sewer System Overflow Control Measures did not meet the Performance Criteria, Elyria shall identify and describe in detail deficiencies or performance-limiting factors in system design, process, operations, and maintenance that may have limited the ability of the Sewer System Overflow Control Measures to achieve their intended performance; and
6. Identify and describe in detail all necessary and feasible corrective measures, alternative operating strategies and additional facilities and processes necessary to meet the Performance Criteria.

Table D-1: Typical Year Rainfall Characteristics

Storm Number	Date	Hour	Duration (hour)	Depth (inches)	Average Intensity (in/hr)	Maximum Intensity (in/hr)	Storm Number	Date	Hour	Duration (hour)	Depth (inches)	Average Intensity (in/hr)	Maximum Intensity (in/hr)
1	1/3/1991	12	1	0.01	0.01	0.01	62	7/3/1993	2	1	0.01	0.01	0.01
2	1/5/1991	13	10	0.18	0.02	0.03	63	7/4/1993	16	1	0.44	0.44	0.44
3	1/9/1991	13	2	0.03	0.02	0.02	64	7/6/1993	16	1	0.47	0.47	0.47
4	1/11/1991	4	19	0.39	0.02	0.09	65	7/11/1993	20	3	0.35	0.12	0.24
5	1/12/1991	12	21	0.04	0	0.01	66	7/19/1993	14	2	0.14	0.07	0.13
6	1/15/1991	24	8	0.33	0.04	0.08	67	7/26/1993	6	2	0.04	0.02	0.02
7	1/16/1991	19	10	0.17	0.02	0.03	68	7/28/1993	17	9	1.08	0.12	0.72
8	1/20/1991	13	30	0.53	0.02	0.05	69	7/29/1993	20	3	0.67	0.22	0.31
9	1/26/1991	7	10	0.03	0	0.01	70	8/2/1993	5	2	0.42	0.21	0.41
10	1/27/1991	19	4	0.08	0.02	0.03	71	8/3/1993	21	10	0.42	0.04	0.2
11	1/29/1991	20	11	0.37	0.03	0.1	72	8/6/1993	19	4	0.1	0.03	0.06
12	1/30/1991	18	1	0.01	0.01	0.01	73	8/7/1993	13	1	0.13	0.13	0.13
13	1/31/1991	14	1	0.01	0.01	0.01	74	8/10/1993	16	2	0.02	0.01	0.01
14	2/5/1991	7	1	0.01	0.01	0.01	75	8/11/1993	4	4	0.24	0.06	0.23
15	2/6/1991	15	9	0.1	0.01	0.02	76	8/12/1993	17	1	0.02	0.02	0.02
16	2/10/1991	15	20	0.73	0.04	0.09	77	8/16/1993	4	1	0.07	0.07	0.07
17	2/13/1991	14	59	1.53	0.03	0.16	78	8/20/1993	9	1	0.01	0.01	0.01
18	2/16/1991	24	14	0.18	0.01	0.04	79	8/28/1993	2	1	0.06	0.06	0.06
19	2/18/1991	15	13	0.08	0.01	0.04	80	8/31/1993	13	6	0.03	0.01	0.02
20	2/19/1991	17	7	0.29	0.04	0.1	81	9/2/1993	8	21	1.02	0.05	0.67
21	2/26/1991	4	40	0.08	0	0.01	82	9/6/1993	13	1	0.35	0.35	0.35
22	2/28/1991	9	4	0.04	0.01	0.02	83	9/7/1993	9	1	0.01	0.01	0.01
23	3/2/1991	1	14	0.06	0	0.02	84	9/10/1993	1	1	0.01	0.01	0.01
24	3/3/1991	13	24	0.7	0.03	0.1	85	9/10/1993	13	1	0.01	0.01	0.01
25	3/6/1991	6	14	0.83	0.06	0.13	86	9/15/1993	20	16	2.38	0.15	0.4
26	3/9/1991	18	2	0.07	0.04	0.05	87	9/22/1993	24	16	0.12	0.01	0.05
27	3/10/1991	12	4	0.08	0.02	0.03	88	9/25/1993	16	20	1.63	0.08	0.29
28	3/17/1991	21	31	0.5	0.02	0.07	89	9/27/1993	13	9	0.15	0.02	0.06
29	3/22/1991	6	4	0.32	0.08	0.18	90	9/28/1993	10	3	0.23	0.08	0.12
30	3/22/1991	24	3	0.14	0.05	0.08	91	9/29/1993	10	17	0.97	0.06	0.24
31	3/23/1991	24	10	0.23	0.02	0.06	92	10/1/1993	10	1	0.01	0.01	0.01
32	3/26/1991	13	1	0.02	0.02	0.02	93	10/1/1993	23	6	0.58	0.1	0.22
33	3/27/1991	24	1	0.62	0.62	0.62	94	10/9/1993	6	13	0.43	0.03	0.13
34	3/31/1991	19	6	0.07	0.01	0.03	95	10/16/1993	22	16	0.6	0.04	0.18
35	4/1/1993	23	5	0.16	0.03	0.07	96	10/19/1993	15	1	0.04	0.04	0.04
36	4/2/1993	17	12	0.06	0.01	0.02	97	10/20/1993	15	6	0.04	0.01	0.02
37	4/9/1993	14	16	0.77	0.05	0.09	98	10/27/1993	22	4	0.15	0.04	0.1
38	4/11/1993	16	1	0.09	0.09	0.09	99	10/30/1993	10	39	1.67	0.04	0.12
39	4/14/1993	19	2	0.03	0.02	0.02	100	11/1/1991	17	1	0.01	0.01	0.01
40	4/15/1993	23	3	0.34	0.11	0.16	101	11/7/1991	9	12	0.12	0.01	0.02
41	4/19/1993	17	13	0.27	0.02	0.11	102	11/11/1991	2	7	0.69	0.1	0.14
42	4/20/1993	16	18	0.61	0.03	0.13	103	11/12/1991	11	12	0.21	0.02	0.06
43	4/24/1993	12	2	0.03	0.02	0.02	104	11/15/1991	1	31	0.62	0.02	0.1
44	4/25/1993	8	15	0.46	0.03	0.16	105	11/18/1991	17	21	0.3	0.01	0.1
45	4/30/1993	1	6	0.1	0.02	0.03	106	11/20/1991	17	19	0.46	0.02	0.14
46	5/4/1993	13	25	0.63	0.03	0.22	107	11/23/1991	20	3	0.24	0.08	0.12
47	5/19/1993	4	6	0.15	0.03	0.07	108	11/24/1991	17	8	0.03	0	0.01
48	5/23/1993	16	1	0.01	0.01	0.01	109	11/25/1991	14	1	0.01	0.01	0.01
49	5/24/1993	6	6	0.08	0.01	0.04	110	11/28/1991	6	8	0.19	0.02	0.05
50	5/28/1993	24	2	0.03	0.02	0.02	111	11/30/1991	6	1	0.04	0.04	0.04
51	5/31/1993	23	2	0.16	0.08	0.08	112	12/2/1991	16	17	1.19	0.07	0.29
52	6/3/1993	23	2	0.07	0.04	0.04	113	12/3/1991	21	11	0.06	0.01	0.02
53	6/5/1993	5	6	0.37	0.06	0.25	114	12/12/1991	15	17	0.16	0.01	0.06
54	6/7/1993	16	9	1.56	0.17	0.67	115	12/14/1991	7	6	0.15	0.03	0.12
55	6/9/1993	10	1	0.21	0.21	0.21	116	12/15/1991	16	16	0.07	0	0.01
56	6/9/1993	24	1	0.24	0.24	0.24	117	12/18/1991	3	2	0.02	0.01	0.01
57	6/19/1993	6	2	0.31	0.16	0.22	118	12/18/1991	16	16	0.03	0	0.01
58	6/20/1993	13	26	0.54	0.02	0.15	119	12/20/1991	22	8	0.22	0.03	0.07
59	6/25/1993	20	1	0.08	0.08	0.08	120	12/23/1991	7	6	0.1	0.02	0.03
60	6/27/1993	18	1	0.94	0.94	0.94	121	12/28/1991	22	35	0.26	0.01	0.03
61	7/1/1993	21	4	0.05	0.01	0.02	Total				37.51		